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French, Earl R.

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Some requirements of the
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[n.p.]

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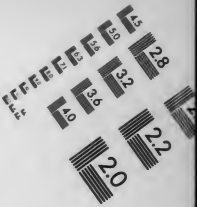
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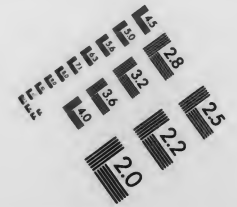
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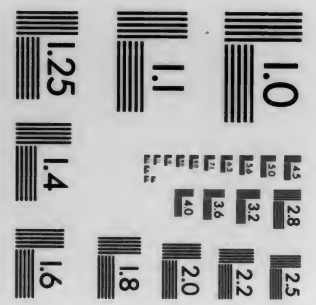
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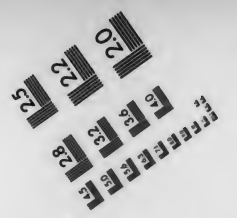
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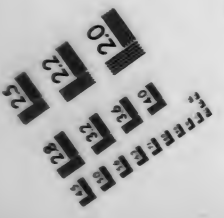
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FRENCH, EARL R.

SOME REQUIREMENTS OF THE N.Y. FRUIT AND
VEGETABLE MARKET.

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SOME REQUIREMENTS OF THE NEW YORK
FRUIT AND VEGETABLE MARKET

EARL R. FRENCH, EXECUTIVE SECRETARY, NEW YORK FOOD
MARKETING RESEARCH COUNCIL, NEW YORK CITY

You, perhaps, have observed the announcement that I represent the New York Food Marketing Research Council. For your information I would like to take just a moment to explain to those of you who are not familiar with this organization just what it is. The institution is new, having been created on the first of last July. Its membership is comprised of those public agencies which are interested in and which center about the New York market; namely, United States Department of Agriculture, Port of New York Authority, Cornell University, Columbia University (School of Business), New Jersey State Agricultural College, and New York State Department of Farms and Markets. The purpose for which the Council was created was to co-ordinate the efforts of the public bodies conducting marketing research, stimulate activity in research in city distribution of perishables and to give united support to reforms found of value. All the work which is being pursued under the auspices of this voluntary body applies to the metropolitan New York district, a district comprised of about 9,000,000 people, and in geographical limits circumscribes a territory having a radius of approximately 25 miles from the Statue of Liberty.

My remarks will be based primarily upon the research of the joint staff of the United States Department of Agriculture and Port of New York Authority, the research work of the members of the different agencies associated with the Council, and of those individuals now working under the auspices of this body. I shall endeavor to express, so far as it is possible for me to do so, the viewpoint of the grower. My aim will be to treat of the city marketing situation from his viewpoint, in fact this is the angle from which I enjoy speaking, inasmuch as I am acquainted with the many marketing problems with which the grower is confronted, having spent 17 years of my life on the farm. My

remarks will be further based upon observations made during my four years' experience in marketing work in New York City.

If one were commissioned with authority and power to make reductions in the spread between the grower's receipts or farm prices and the retail price; if he were empowered to add to the return to the grower; if he had the power to lessen the price to the consumer, at what point should he make an attack? Some would advocate terminal operations and facilities—costs of handling—as being the vulnerable spot in the marketing system; others would say it was the wastage factor, while still many more would point to the middleman's profit. Parenthetically, I wish to add that the last of these suggested causes is too often used by politicians and political groups as a football in the political game. You understand my meaning, I am sure. In order properly to test any of these hypotheses it is necessary to go pretty deeply into an analysis of the conditions, which means intensive research, involving much time and effort.

Two angles of the question present themselves for consideration. One is the physical side which includes physical requirements and service of handling as they relate to city distribution. The other is the commercial requirements and limitations. Taking up the former of these in our consideration of the possibilities of affecting price reductions and, at the same time, giving a larger share to the grower, let us examine the consumer's produce dollar. An allocation of this dollar will show the importance of the different avenues through which it is absorbed, placing in proper perspective the intermediaries and terminal traffic agencies as they figure in the price spread.

Looking first into the feature of terminal handling and cartage costs which are involved we shall see how insignificant is the item of transportation and observe what percentage it constitutes of the consumer's outlay. While it is agreed by all who are acquainted with the New York terminal market that facilities are inadequate, resulting at times in embargoes, congestion and delay, yet there is much danger of over-emphasizing this phase of the situation.

At the freight rate hearing before the Interstate Commerce Commission held in 1921 and 1922, the Erie Railroad exhibited

terminal costs (I. C. C. Docket 1420 and 14244) covering the operations from its classification yards at Croxton, N. J., to pier station at Duane Street. The figures which have been calculated to apply to a car unit represent the actual expense as figured by this carrier incurred in all traffic movement, such as hump switching into hold yards, reclassification in carfloat assembly yard, haul to Hudson River waterfront, bridging operation to carfloat, towing across river and unloading at the pier. The aggregate expense as presented approximates \$35 per car. To this must be added an assorting charge which varies according to the commodity but which, on the average, amounts to about \$3.00. This expense is met by the consignee. For pier-head delivery—the movement from pier station floor to jobber's trucks, as is practiced at the Pennsylvania piers—a further charge of approximately \$25.00 per car is made, giving an aggregate of \$68.00 per car. According to the schedule of the market truckmen's association, the rate per car for trucking produce from the pier station to the Wallabout jobbing market, which is an average distance from the terminal to a secondary market, is about \$40. Totaling the several items a sum of \$103 is obtained, which is the average cost for hauling a car of produce from the classification yards to the average secondary market, a figure which constitutes 9 per cent of the wholesale value, and roughly $4\frac{2}{3}$ per cent of the retail value, according to weighted mean values per car at wholesale and retail for fourteen of the principal fruits and vegetables for a period of sixteen months, 1922 and 1923.

So if we attempt to reduce the margin at this point we cannot hope to effect relatively much of a saving inasmuch as it is only $4\frac{2}{3}$ per cent to begin with. Assuming that a reduction were made, the saving would necessarily be small, percentagely.

Next let us look to the wholesaler's margin. The wholesaler, while in the process of handling the perishables, extracts roughly 7 per cent, or seven cents, of the retail dollar as our studies would indicate. Of course, this figure varies according to the commodity and price, and can hardly be taken as applying to an individual case at a particular time. The range probably

extends from a minimum of five cents to a maximum of 10 cents. Now a word as to how this seven cents is divided.

During the past two or three months I have had occasion to work with Dr. M. P. Rasmussen, of the Department of Agricultural Economics, New York State College of Agriculture, who is conducting a study of produce dealers' costs. Many of both the wholesale and jobbing dealers in the New York market have given their co-operation by supplying figures indicative of the previous experiences of their business. Records covering the total cost of operation for the calendar year 1924 have been secured from operators considered to be very representative. So far as these records have been analyzed they tend to show that on the whole the wholesaler's net returns amount to a very small fraction of total gross sales, averaging somewhere in the neighborhood of 1 per cent. One dealer admitted that he secured for one year, that of 1923, as much as 2 per cent. A few of the statements reveal an actual loss. Salaries and net profits of one or two of the dealers believed to be typical were shown to represent only a fraction of a cent of the seven cents margin which was mentioned before as the portion of the consumer's dollar withdrawn by the wholesaler. The remaining portion is shown to be absorbed in the cost of service these operators perform, and let us not be eluded into thinking that the wholesalers do not perform a real service. I deem it unnecessary to take the time to go into the marketing practices or to enumerate the diverse functions which show that he is justly entitled to practically all he obtains. He spends long hours in the market which are comparable to those spent by the grower in producing the product and repeats this through all the seasons.

Our next consideration is the jobber. This intermediary, as shown by the "Study of Expense Factors in City Distribution" conducted co-operatively by the United States Department of Agriculture and Port of New York Authority, covering fourteen of the principal fruits and vegetables, and extending for a period of sixteen months, withdraws from the retail-price dollar, as his margin, nine cents. However, though this may seem large, yet much the greater portion is expended in the functions of the business incident to the services performed. It would ap-

pear from records obtained so far by Dr. Rasmussen of the cost of operation for year 1924, that of this nine cents the jobber retains relatively a small fraction as net profits, the greater portion being comprised in the expense of doing business. Similar to some of the dealers in the wholesale trade a few of these operators are shown to have suffered a loss during the year 1924.

Next in order is the retailer. This marketing agency absorbs thirty-seven cents of the retail dollar as shown by the study to which reference was made when discussing the jobber. All retailers, irrespective of management, were included when computing this total city retail margin. Of course, as you are undoubtedly already aware, the retail margin varies more or less according to the different types of managements with their varying services, as chain versus unit stores. Inasmuch as I have no figures which apply to the unit stores which would show how this operating margin is distributed in respect to the items of cost, I shall present to you figures recently made available applying to a group of chain stores. The operating margin in the case of this type of store was observed to be thirty-two cents of the consumer dollar. Of this amount about twelve cents was absorbed in salaries of the principals, wages, rent, light, and other items of that nature. About 6 per cent of it goes to meet the cost of trucking. The remaining fourteen and a fraction cents represents actual waste through deterioration, evaporation, loss through reselection, giving good measure, etc. For the period over which our figures apply it is shown that the companies experienced a slight loss on the group of perishable commodities instead of recouping their profit.

Having broken down the consumer dollar, we are now better positioned to determine what might be done in reducing the price spread. With the margins of the wholesalers and jobbers, which were seven cents and nine cents respectively, only a relatively small percentage of deduction could be made at best. Possibly one-half of 1 per cent could be made at this point, or 1 per cent at that point, but on the whole and with the full exercise of mandatory power it would probably be comparatively small. In any case little opportunity it would seem is offered for effecting a saving through a reduction in net profits of these intermedi-

aries. In the case of the retail margin, which, as stated, amounts to thirty-seven cents for all retail stores in New York City, a greater opportunity for narrowing the spread seems apparent, due to the magnitude of the margin itself. Before any conclusions can be reached, however, certain facts must be considered. The consumers have grown to depend upon the intervening city agencies for certain services, such as providing fresh and good quality produce, wide selected variety, delivery on short notice, extension of credit, as well as many others. These service items interpreted in terms of wages, rent, cartage, etc., pyramids the cost of doing business to a point where a wider margin is necessary. If the consumers are willing to forego these services, expense items could be reduced and savings effected in a large way accordingly. Referring directly to that phase of the retail margin representing wastage, I personally believe that much could be accomplished at this point by ascertaining quantitatively the consumer demand for the neighborhood and stocking the supplies of the stores in a manner that would more readily meet that demand. A few cents out of each dollar could perhaps be saved in this way.

The net effect of any and all reductions which may be made in this spread, while highly important in actual dollars and cents, would percentagely be relatively small and would not be easily discernible by the consumer even though it should amount to as much as 10 per cent, owing to the wide varying price changes resulting from the unbalanced forces of supply and demand, also as a result of the varying purchasing power of the dollar.

Now, on the other hand, let us look at the commercial side of the picture. The greatest losses experienced by the grower occur through the maladjustment of supply to demand. I think we can make that statement unqualifiedly. I think we can say that perhaps it is a many fold greater cause than any of these we have mentioned. Taking as a concrete case to illustrate this point: It was noted, for example, that the price of best quality lettuce on the New York wholesale market about the middle of April, 1923, was \$7.00 per crate. Three weeks later, or about the 10th of May, this same crate was being offered for sale at seventy-five cents per crate. Can it be in such instances that the demand has shifted to such a striking degree? It is not conceivably pos-

sible that that is what took place. On the contrary, it was the supply which, in the main, had promoted this situation. It had varied to a great extent while the potential demand had remained more or less constant—varying only as it might have been influenced by the weather and seasonal factors, “diminishing marginal utility” of groups using the product, etc. The number of cars on track varied from eight when the price was \$7.00 per crate to ninety-two when the same unit was being offered for seventy-five cents. When the supply or volume of the perishable commodities in the market varies to any important degree, it follows that such is reflected by proportionate price change; not directly, however, but indirectly.

After two of the factors in the exchange triangle, namely, actual supply (physical volume within the market) and demand (estimates of buyers) are definitely established or fixed, as is the actual case on each morning at the opening of the market, the third factor, or price, is the only alterable one. Should the supply be small or large the price goes up or down according thereto, bringing thus into equilibrium the supply with the effective demand. Only after this balance is reached does trading begin.

With the demand the grower has no control; however, with the supply he can do much to effect a helpful influence. Through this medium much is to be accomplished in the way of bettering marketing conditions. In this statement I have not lost sight of the tremendous advantages to be gained through such services as standardization, proper grading, packing, fair dealing, etc. However, if orderly marketing is to ensue, if alternate gluts and scarcities are to be eliminated and steadier prices maintained, it is for the growers to adjust their shipments so that the supply will more evenly match the demand requirements.

It is informative to note the extent to which losses are prevalent in the New York market. A sort of barometer has been set in an automatic way which indicates when supplies are excessive and dumping is in practice—that being, rejections at the piers by consignees because the price is below the freight charge plus a small fixed marketing charge. To give you a clear conception of what is meant, let me refer to chart No. 1, covering seasons 1922 and 1923 and applying to the commodity lettuce.

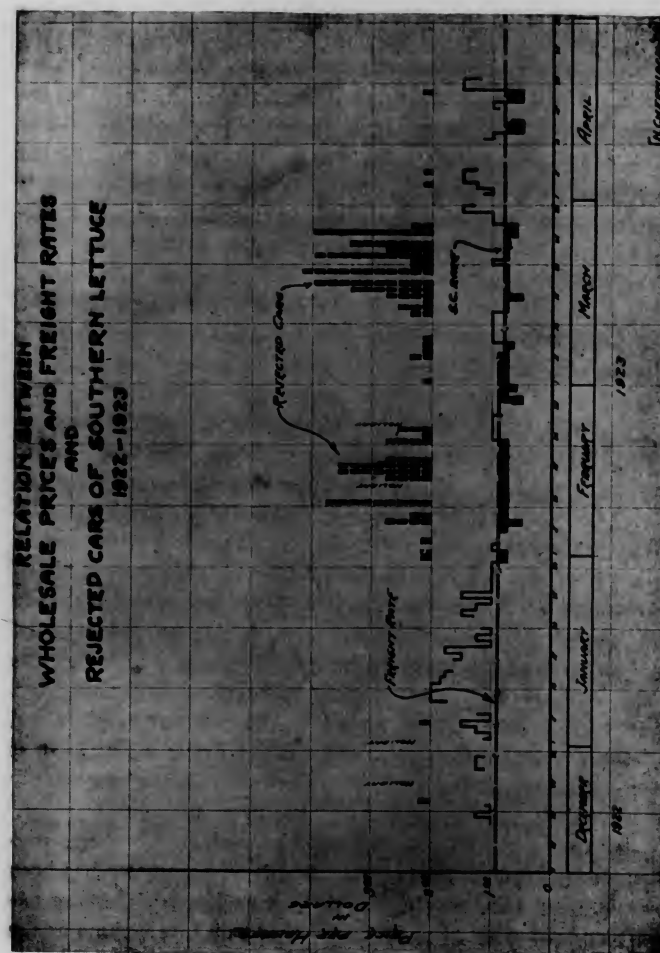


Chart 1

The dark line observed running horizontally through the graph represents freight charges. Above this line, and on the upper part of the chart, appears several rows of oblong blocks, each one of which represents a rejected car. When the price, which is the wavy black line, drops below the freight rate the number of cars rejected increases. Close inspection will show that in no case are rejections of consequence when the price is moving above the freight line.

I appreciate the fact that figures are dry fodder and many of you do not care for them. Nevertheless I deem it worth while to introduce some here to indicate to you how significant are the losses on fruits and vegetables in the metropolitan New York district. The figures which I shall read are drawn from the records of the Pennsylvania Railroad and apply to the years 1921, 1922 and 1923. In 1921 twenty-five cars of lettuce, fifty-five cars of cabbage, eleven cars of celery, and twenty-four cars of spinach were rejected by consignees. That means that after these vegetables were produced, harvested, crated, packed, loaded into the car, and shipped, the grower realized no returns on them whatsoever. The freight deficit on these cars alone amounted to \$27,900. That is to say, that portion of the contents of the cars which was not damaged and for which a buyer could be secured was sold for whatever could be procured for it, yet the sum obtained was insufficient to cover the regular freight charge and thus a deficit of \$27,900 resulted to the railroads. In 1922 202 cars were rejected with a freight deficit of \$40,000. In 1923 141 cars of lettuce, and 80 cars of cabbage were rejected by consignee with the consequential freight deficit of \$50,000. Of the 141 cars of lettuce over 40 were dumped. These figures do not include the vast number of cars that were sold in the market at a price at, or slightly above, the freight rate plus the fixed marketing charge and which returned to the grower little, if any, profit to apply toward his labor in producing the product. It should be emphasized that the number of cars falling in this category is very large.

This sort of marketing practice has been in existence for the whole period for which we have any records and extends back a number of years. The reason why it is continued on such a

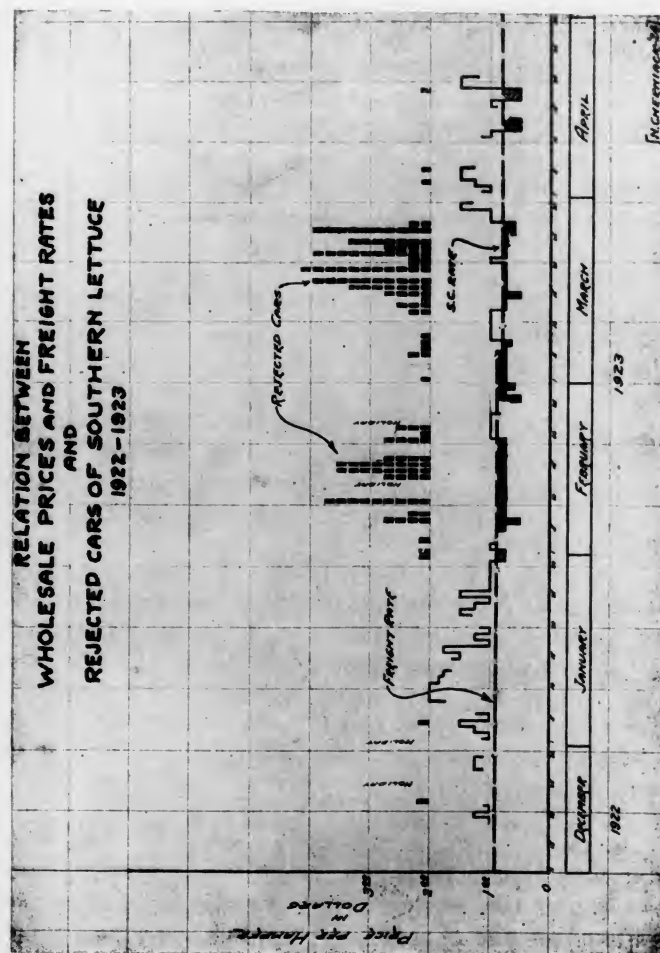


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This sort of marketing practice has been in existence for the whole period for which we have any records and extends back a number of years. The reason why it is continued on such a

large scale is due, I presume, in a large measure to the fact that the farmers who experience these losses are widely scattered. It may be a shipper's car in some one of the many different localities of North Carolina, or New Jersey, or Georgia, or Florida, or Maryland, or New York, which was rejected. It is true, no doubt, that owing to this wide geographical distribution little is known by one of these producers regarding the marketing losses that are being borne by the others. At least, the attention and concerted effort of this group of the producing and shipping elements has not been focalized to the point where a united front has been presented for the regulation and protection of their interests.

Another side to this picture is the human or social element. Scanning the records of the wholesalers, it is observed, in many instances, in which losses have occurred, that the farmers have failed to meet the freight deficit which is chargeable to them. I wonder, in a good many of such cases, if the refusal to pay is not because these small producers have not the necessary funds to meet these obligations. Being forced by the stress of economic conditions to let these debts remain outstanding, the more honest and sincere men making up this class are robbed of their self-respect and are made thereby less valuable citizens to the community.

The position of these men is something similar to the sheep farmer in Texas who shipped to the New York market a carload of sheep. On receipt of the return slip he read "Your sheep failed to bring freight charges; kindly remit funds to pay freight." The farmer wrote back saying, "I have no money but I will send you more sheep."

As we view it there are two things that are needed. First, the necessity for growing what the market wants and will use, and that includes packing, grading, and standardizing, and second, ascertaining what the market requirements are, both qualitatively and quantitatively. The former of these is, of course, for the agricultural colleges, experiment stations, horticultural societies like this body, and the State organizations and Federal Government to determine and apply. As to the latter, organizations such as the New York Food Marketing Research Council

are endeavoring to develop the essential information applying thereto. As to how such information when developed may be applied I shall not enter on a discussion here. Suffice it to say that it is of a regulatory nature and, therefore, reaches beyond the scope and jurisdiction of our activities. Explicitly, the type of information which we believe is vitally necessary in any attempt to effect orderly distribution and on which we are concentrating our attention in the New York district is a quantitative determination of the absorbing power or potential demand of the market. Expressed another way, our purpose is to ascertain, first what supply or number of cars may be placed in the market under varying conditions and yet not drive the price below the freight charges, and second, what supply will result in a return to the grower according to the quality of the product an amount sufficient to cover his cost of shipping plus his cost of growing.

Our method of approach in determining the potential demand requirements is the application of statistical method to marketing data descriptive of previous years experience. Price determinants are segregated and evaluated both as a part of supply and as an influence on demand. Working to produce an effect on the price from day to day are such demand and supply factors as day of the week, holidays, season, weather conditions, condition of the produce, quality, and physical volume offered for sale, have been found. By proper mathematical treatment by the process referred to as correlation, it is possible to evaluate, to some degree, the net influence which these factors exert upon the price.

In the execution of a commodity demand analysis covering more than one season for any given city, it is necessary to take into account economic forces embracing the whole nation. It is not possible to divorce any unit or section from the nation as a whole and yet obtain the best results. Insofar as our surveys have extended it has been shown that the general yearly price level is largely determined by the total national production. Having established the price level based upon actual production, the next logical step, it would seem, is to proceed to the consuming unit, a section like New York or Chicago, and from statistical data applying to these markets directly determine the forces that cause the price to vary above and below this general level.

In order that you may visualize the relationship or general law that has been found to exist between total production and average yearly price I wish to refer you to Chart No. 2, which is a scatter diagram of the two variables—peach production and average yearly farm prices.*

In the top section of the chart we have plotted along the horizontal line production in millions of bushels covering the period from 1910 to 1924, exclusive of the three war years, while along the perpendicular line is plotted corresponding farm prices in cents per bushel. The first impression to be drawn from this illustration is that the scatter about any line of average relationship which may be drawn is very large, indicating that the production influences actual price relatively little. It is observed that with a production of 53,000,000 bushels the farm price for one year was \$1.15 per bushel, while with the same production for another year the price was \$2.00 per bushel, a variation of 75 per cent. Next, directing our attention to the lower section of the chart, which is a plot of the same two variables but after prices have been deflated by use of an index of general price levels, a remarkable relationship is seen. By the introduction of the index which is nothing more than an indicator of the purchasing power of the peach dollar expressed in terms of groceries, clothing and other merchandise which is purchased by the grower, prices have been reduced to a comparable basis. Instead of finding a 75 per cent difference in the average farm prices for the same production, it is noted that following this correction the percentage difference is almost negligible. Reading the co-ordinates from lowest to highest it is seen that a production of 33,000,000 bushels sets an average yearly price (deflated) of \$1.60 per bushel while the production of 64,000,000 bushels sets a price on the average of only eighty-five cents per bushel.

This relationship as shown to be established between size of crop and annual price level applies not only to the perishables but is likewise applicable to the more staple commodities as is demon-

*United States Department of Agriculture Year Book, 1924.

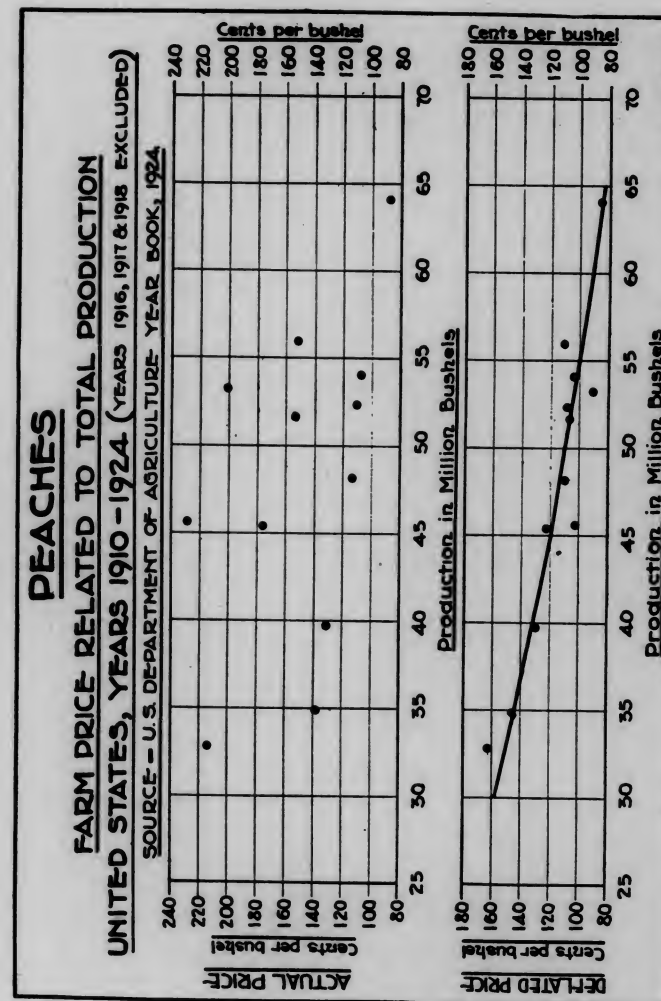


Chart 2

strated by Chart No. 3, which is a similar scatter diagram plot of yearly apple production and average yearly farm prices (actual and deflated) from 1910 to 1924 inclusive.*

Again it is to be noted by an inspection of the upper section of this graph that little relationship exists between actual apple production and actual apple prices. In any event the law is indefinite. However, after deflating prices on the same basis as previously described a very distinct and remarkably close relationship is shown to exist between the two variables; this is demonstrated by the lower section of the chart. These graphical illustrations are adequate to establish the importance of the total crop produced as a factor in establishing the seasonal price level for the highly perishables as well as the more staple commodities. The general price level, as our studies would indicate, would vary from 1 to 75 per cent from one year to another, due to the amount produced. However, from prices prevailing for potatoes during the current year compared with the prices paid last year one is almost prone to say that production might influence the general price level from one year to the next as much as 300 or 400 per cent. It becomes apparent, therefore, that in any attempt to evaluate the potential demand of the market from day to day in price terms it is necessary to give due consideration to the total production.

Chief among the forces operating to influence the day to day price movement within the bounds of the city market is the volume of supply. Particularly is this statement true for the perishables. Losses through rejections, spoilage, and in other ways are closely associated with the supply as is exemplified in times of gluts. This point is well emphasized in Chart No. 4, which is descriptive of the conditions prevailing in the New York watermelon market during the season of 1924.

Price and supply (cars on track adjusted for daily variations) are plotted chronologically as represented by the two solid wavy black lines which move from left to right on the chart. Immediately upon viewing this graph one is struck by the closeness of the inverse relationship between these two series. When the supply is very high the price on the same day is very low and vice versa. The heavy dark shading represents the per cent of cars

* United States Department of Agriculture Year Book, 1924.

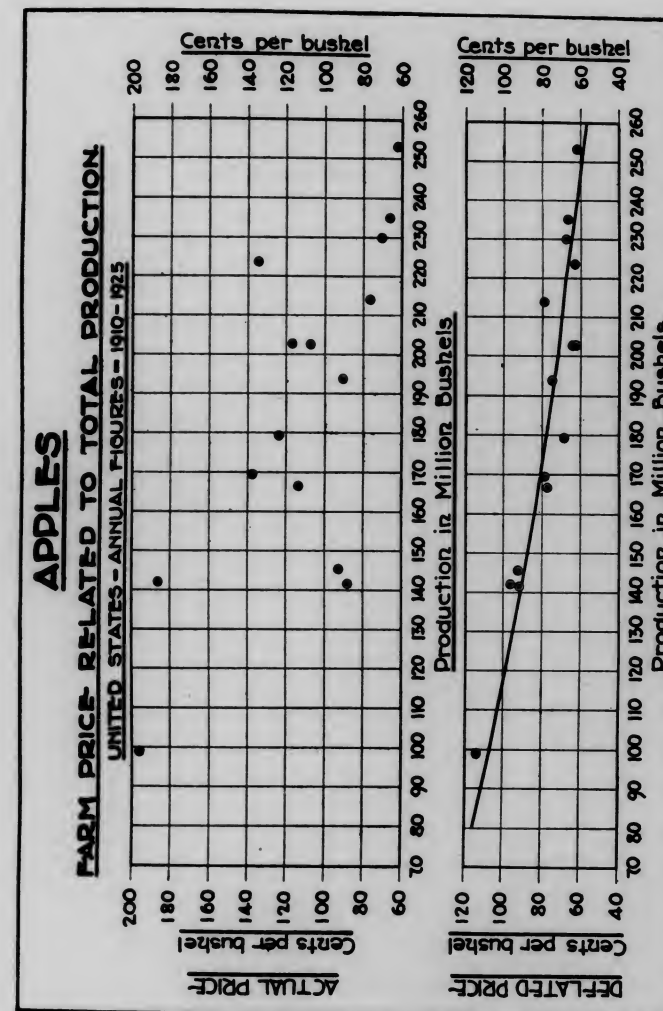


Chart 3

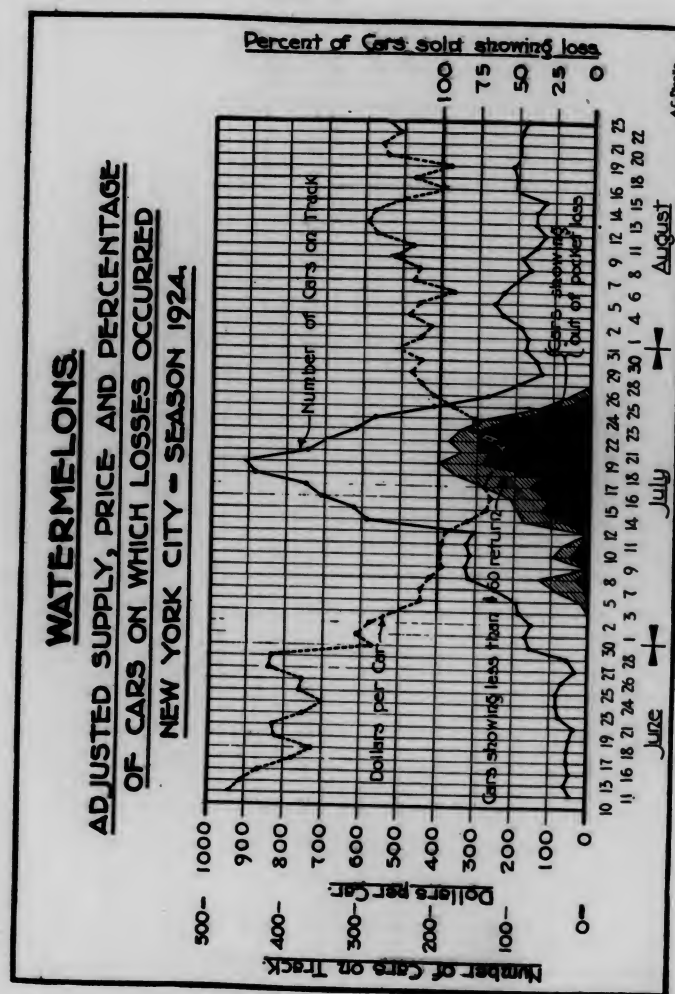


Chart 4

sold on each day which resulted in an out-of-pocket loss to the shipper. The losses, we see, were confined to the period when supply was large and the corresponding price relatively low. Owing to the fact that the carriers require a freight guarantee on watermelons before they accept the cars for hauling, the grower or consignee is required to contribute the difference should they not bring freight when sold. You will observe that on five days during the period approximately 70 per cent of all the cars moving into consumption were sold at a price less than the freight charges. The loss depicted by this freight deficit plus the small handling charge was approximately \$16,000 or what amounts to roughly 16 per cent of the total value of all cars included in the sample from which this analysis was made. In all of these instances the growers or shippers were required to pay extra money for the privilege of shipping. The lighter shaded portion represents the per cent of cars on which the growers received \$60.00 or less per car, or what we assume to be the minimum cost required to produce a car of melons. Granting the validity of this assumption, we see that for one day during the period, that for the peak day of supply, the grower's returns on 100 per cent of the cars sold were less than the cost of production. It is hardly necessary to add the comment that the marketing of watermelons during the glut period was not only unprofitable business but was a ruinous one.

As a qualitative consideration of the market requirements it is of economic significance to note what grades or sizes were constituted in these cars on which losses occurred. In Chart No. 5 the portion of total cars sold which resulted in an out-of-pocket loss to the growers and on which \$60.00 or less was returned is shown according to size or grade of melon. From this chart we observe that for the twenty-pound melons, which is of course one of the smallest sizes marketed, 90 per cent of all the cars sold during the glut period resulted in an out-of-pocket loss, while the remaining 10 per cent returned \$60.00 or less per car. For the twenty-two-pound melons approximately 65 per cent represented out-of-pocket loss, the balance, or 35 per cent, returning no more than \$60.00 on any car. Moving from the smaller to the larger sizes it is shown in like manner that the larger melons

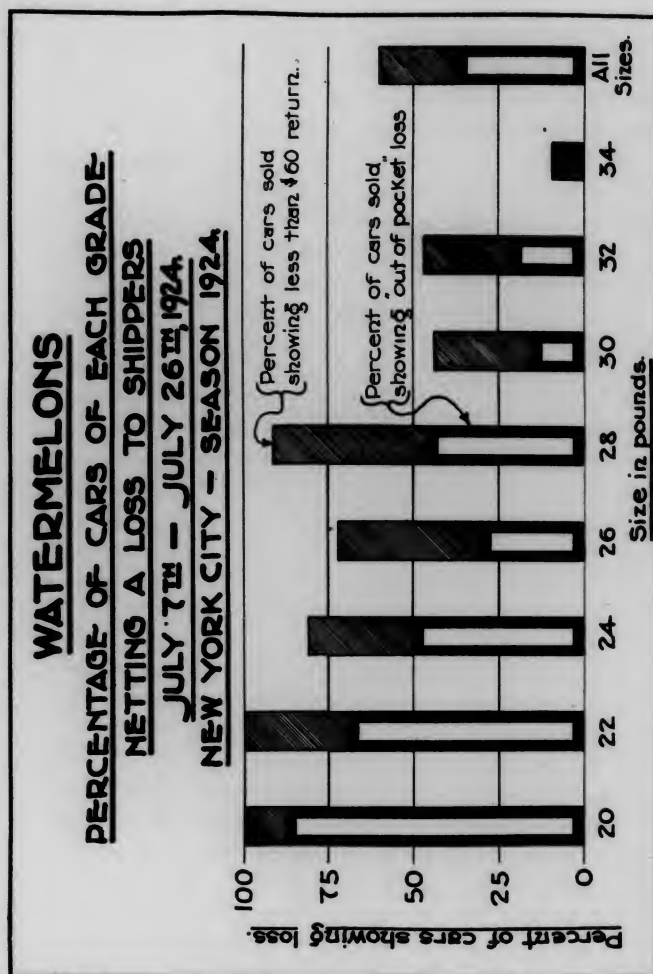


Chart 5

are in stronger demand as exemplified through larger returns, with the exception of the twenty-eight-pound size (or grade) which is, in this respect, a little out of order. This is due, however, not to the size, but to the general sales policy of one of the dealers from whom records were obtained. This particular dealer, who handled primarily the twenty-eight-pound size, was committed to the policy of obtaining freight costs at least and, in adhering to this commitment, held his melons until many had deteriorated; consequently forcing the sale of a few cars for as low as \$100.00. Looking at the last size recorded, that of thirty-four-pound, it is to be seen that 6 per cent of the cars returned \$60.00 or less while the other 94 per cent showed a gross profit of \$60.00 or more to the grower.

This simply demonstrated the advantage, yes, we might say the necessity of marketing only the best quality produce when the city market is over-supplied. It is invariably true, of course, that with the opening of the season and when the available volume is small, gross returns are to be obtained on smaller sizes and lower grades. But it is also true with the majority of the perishables that with the advance of the season the time is reached when it is wise to keep this type of foodstuffs out of the market, wise in the sense that the costs of grading, packing and loading in cars are saved, also out-of-pocket losses averted. Making more explicit this point, I wish to refer you to Chart No. 6, showing the relationship between the return to grower per car according to sizes and the supply on track adjusted for daily variation.

Each of the curved lines, which represent different sizes extending from size 20- to 34-lb., represents the average relationship between the dollar return per car shown by the scale at the left side of the chart and the supply on track as scaled on the horizontal line at the bottom of the chart. If the grower is to receive \$60.00 for his 22-lb. melons, which, as we said before, is the minimum cost of growing, he must not place cars in the New York market when the supply exceeds 100 cars on track. Again, interpolating the chart further and referring to the 26-lb. size, we see that if the grower is to receive \$60 return on this size melon he must not place his shipments in the New

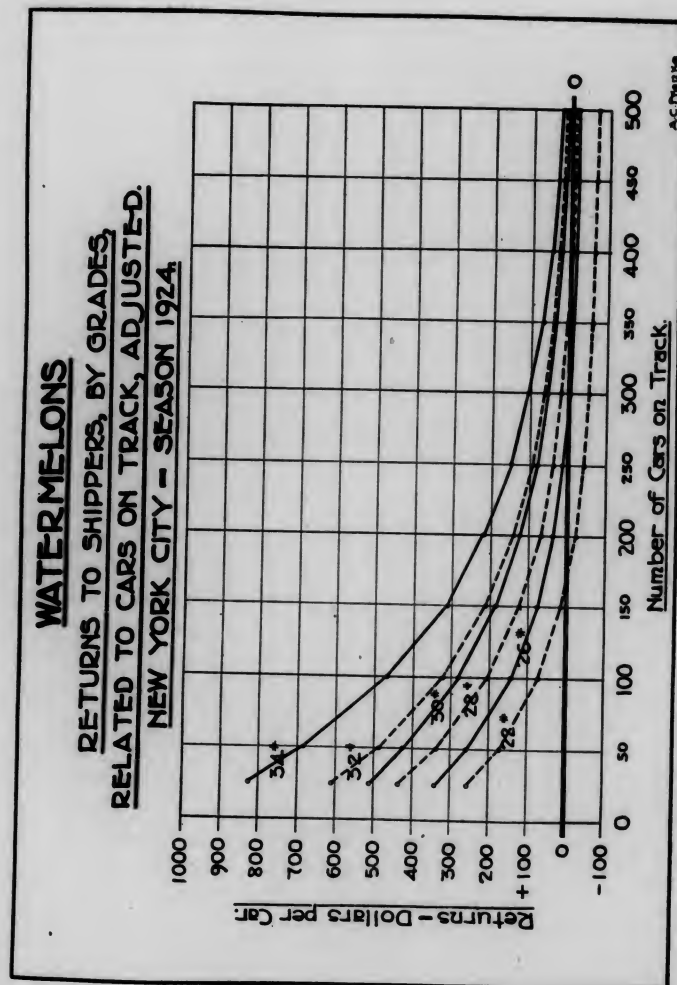


Chart 6

York market when 150 cars or more are already on track. Even the 34-lb. melons will not return \$60.00 to the grower when there are 400 cars standing in the New York watermelon yards. The same quantitative measurements, we believe, can be worked out to apply to apples, cantaloupes, peaches, or for almost any other commodity which is being marketed in volume, and it is our intention to carry these studies further. In fact, in looking forward to developing this sort of information over a wider range of commodities we have recently initiated studies applying to apples and peaches.

How can the grower or shipper know when to ship or when not to ship, or to what market he should send his product? At the present time his guide is primarily the history of prices which may be and often is a misleading criterion. Quoted prices portray in an excellent manner the conditions which prevail on the day they were collected, but are not by any means a good indicator of the conditions in the market two, three or five days hence—the time required to move the product from the farm to the market. Using prices as a rule to gauge shipments often proves in its effect disastrous. Furthermore, following the estimates of dealers who are located in the various markets does not always prove to be a wise policy. So far as our experience extends, and it covers the operations of several dealers, it has been demonstrated that these operators are not able to estimate in advance the market requirements, as is evidenced by their purchases—f. o. b. trading. They may realize gross profits to the amount of \$200 or \$300 per car at one time, while at another they will suffer losses equally as large. If it were true that they are able to judge a future market even with a fair degree of accuracy these losses obviously would not prevail. At those times when gluts become a reality these dealers, of course, are in a more advantageous position than that of the grower, inasmuch as they are located within the market proper and are thus able to more closely observe the true conditions. It follows that in such times there operators revert in their trading from f. o. b. purchase to consignment, thereby shifting the entire control of car movement and the responsibility of waste and losses following oversupplied markets back to the farmer. For the shipper

to emulate these men at such times would prove, as a general rule, a wise course of action. Without pursuing this point further, I think we can make the general statement that by and large the information which is disseminated from the city markets is not an adequate guide upon which farmers might regulate shipments of the more highly perishable products.

It is our hope to make a contribution to this field and develop material which will be of greater use to the growers than merely the history of prices, or individual estimates based upon "hunch" or "rule of thumb" in indicating in advance the market needs. As previously remarked, the volume of supply is the chief factor in determining market conditions, therefore it is necessary to foretell in a general way what the measure of this item will be. Such measure is possible of calculation with some degree of accuracy. Through the daily reports issued by the United States Department of Agriculture of car lots of the different commodities arising in the several States, total volumes which will eventually reach some market is known. By relating this volume, which is, of course, the total available supply moving, with the receipts in the city market, first allowing for certain influences as volumes shipped, day of the week, supply on track, etc., we have found that it is possible in the case of the New York market, for those commodities studied, to predict with a relatively small percentage error the number of cars which will arrive. In making this calculation it, of course, is necessary to lag receipts in accordance with running time from the several States. From a formula derived from a preliminary study of watermelons for the season 1923, predictions for this commodity were made through a portion of the 1924 season. Until the market had become glutted in an extreme way and abnormal conditions were prevailing, the accuracy of these predictions was very striking. The approaching glut which started on Monday, July 14th, was foretold four days in advance. Our forecast on Thursday, July 10th, for Sunday and Monday arrivals was 240 cars. The number arriving totaled 232, showing a difference of 3 per cent. In giving you these figures I do not mean to say, or imply, that we are able to predict at all times with such a high degree of accuracy. Of course, such is not possible. Significant, how-

ever, is the fact that it is possible to foretell even in a general way what supply is to be expected.

These same reports of car shipments are followed very closely by a large number of produce dealers and even country shippers, each using them as a basis in estimating probable arrivals. It is surprising, however, in talking to some of the former of this group, to learn what different interpretations are placed upon these reports. For example, one of the dealers with whom I was discussing this point as applying to watermelons said, "We figure that for the total cars of watermelons originating in the southern States a constant 12 per cent will come to the New York market throughout the season." Another said, "About 10 per cent of shipments arrive here in New York." Quoting still a third dealer, "There appears to be little or no constancy in the percentage that might arrive, according to my observations. I observed that at one time about 400 cars were shipped from the States supplying this market, out of which forty-two came to New York, while at another time when the same number of cars were reported as being billed out a total of seventy-seven arrived." The application of statistical method to this data tends to clarify what seems to be a complicated problem. In the first place, the day of the week is shown to influence the volume of receipts. If Friday should be the day of prediction the calculations should be for a much smaller per cent than for Sunday or Monday. Second, the supply within the market may influence the running time as much as two, three or four days. As the market approaches the saturation point operators detain cars while en route at transfer points for reconsignment to a center promising the best returns. This delay obviously reduces the percentage of receipts to arrive below the average temporarily and augments it a few days later. The third consideration is the varying per cent which arrivals are of shipments, depending upon the volumes originating. At the beginning of the season, when few cars are rolling, the New York market, being a premium market, will receive a much larger portion of the shipments than it will at a subsequent date. As much as 50 or 75 per cent of the product will go to that market when the season first opens and only a very few cars are moving. In the case of

watermelons, receipts diminish from 70 to 12 per cent when the daily shipments grown from two or three cars up to 100. While daily shipments are growing from 100 to a thousand cars the receipts in this market decline from 12 to 9 per cent. After shipments exceed 1,000 cars receipts begin to revive again and climb up to a 14 per cent level when total cars originated have reached 1,700. The reason for this peculiar phenomenon, we believe, is explainable on this ground: When all of the markets are more or less glutted the shipper is more willing to take a chance on the New York market than any other and thus a larger pro rata share of the supply is diverted to this mart.

In the case of the highly perishable commodities, as lettuce, spinach, and the like, it is only necessary to foretell the amount arriving in order to gain a fair idea as to the volume of supply and thus a broad general conception of what the marketing conditions purport to be, bearing in mind, however, that the supply while one of the chief factors is only one among several influencing price. However, on those commodities on which carry-over is a feature—stored commodities, either track or refrigeration—it is essential to know something about the amount retained from day to day and which will be comprised in the supply the day following. In obtaining estimates of carry-over, again the statistical tool has proven a valuable instrument. A relationship between supply and volume moving into consumption has been found to exist through our analysis of the data pertaining to watermelons, thus we are able to determine fairly well the amount that will be absorbed from a certain supply and consequently make predictions of carry-over. By the values accumulated from day to day, derived by applying the two formulae *shipments and receipts* and *volume and supply moving into consumption*, estimates of total supply may be formulated which are, we believe, of practical value. Referring to Chart No. 7 it may be seen what has been accomplished in the way of forecasting the supply of watermelons three days in advance.

The curves represent actual and estimated supply. It is observed that the two series move very closely together during a greater portion of the season, deviating to an appreciable degree only during the latter half. The lower estimates in this latter

WATERMELONS IN NEW YORK CITY, 1924.

SUPPLY ON TRACK AND ESTIMATES MADE 3 DAYS PREVIOUS

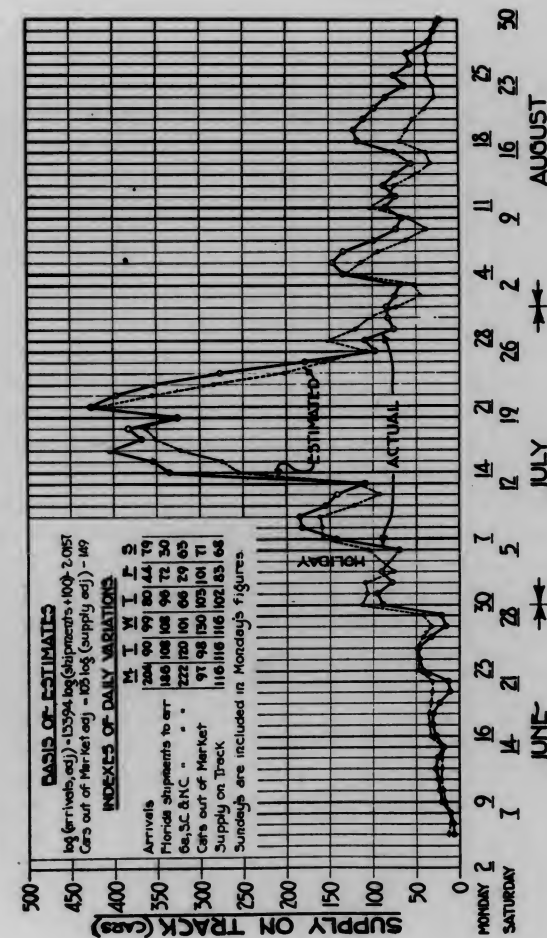


Chart 7

period we believe are attributable, in good measure, to declining seasonal demand for which a correction was not attempted in this preliminary analysis. Another point which should be mentioned in this connection is the closeness with which the general movements are predicted. Both the major and minor swings are foretold remarkably well.

Supposing that information were developed that would give an excellent measure of the potential demand at various markets, at Boston, New York, Philadelphia, Baltimore, Pittsburgh, etc., would it be possible to better marketing practices in the way of effecting steadier prices, avoiding gluts and scarcities and reducing wastage? In making this inquiry, no doubt a question arises in your mind regarding the present conditions and how and to what extent might improvements be made in distribution. To answer this question let us examine present practices, ascertaining if distribution is equal at all times with respect to the different markets or if one market is flooded at a particular period resulting in low prices when at the same period another market has a relatively small supply with soaring prices.

Our research endeavor in the field of price comparisons as between cities has clearly shown that such is the actual case. Prices of cantaloupes in the Boston and New York markets for the past two seasons are shown to be alternately high and low. The Boston price will vary as much as 20 per cent both above and below the New York City price. Likewise watermelon prices between Philadelphia, Boston and New York can be characterized similarly. In the latter case it has pretty well established that distribution is at fault for it has been demonstrated that price ratios between markets are inversely related to the ratio of supply between the same markets. Graphs have not been prepared as yet applying to watermelons which would illustrate this point, therefore, at this time I am able to refer you only to graphic illustrations applying to tomatoes. Examining Chart No. 8 which is a chronological plot of weekly prices for U. S. No. 1 six-basket crates for the markets of New York and Baltimore* it is readily seen that wide variability in the price movement is

* Bureau of Agricultural Economics, U. S. Department of Agriculture.

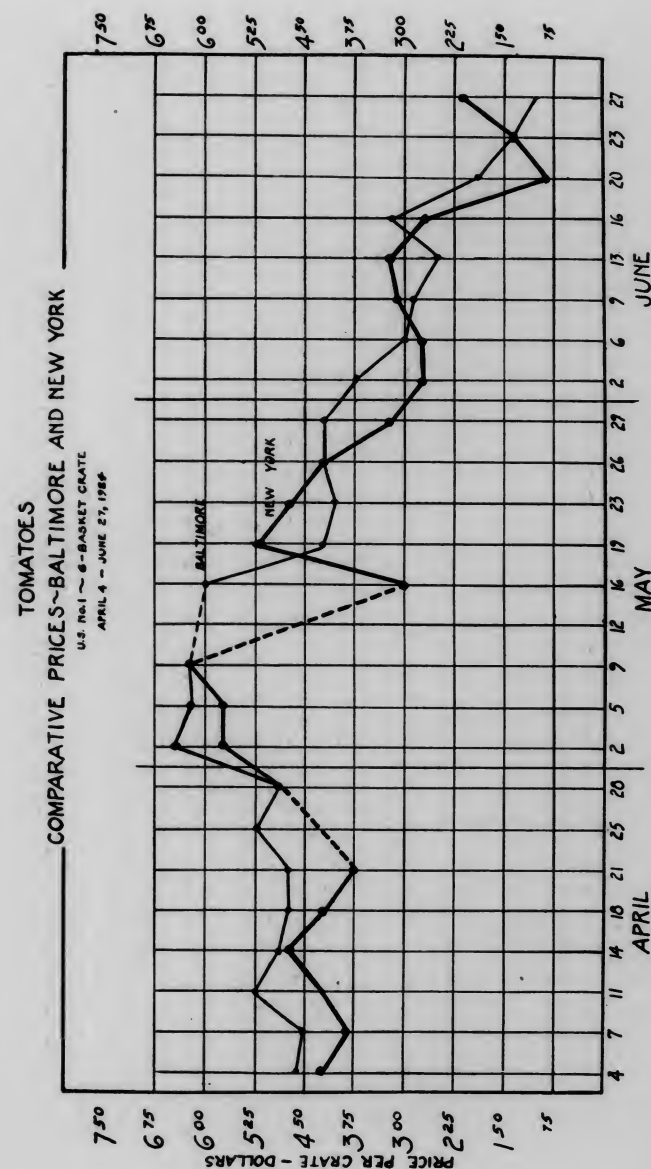


Chart 8

characteristic. Prices appear to alternate, being high in one market and low in the other at the same time and vice versa. On Friday, May 16th, the New York price was \$3.00 per crate as against \$6.00 at Baltimore—100 per cent greater value. On the following Monday the situation was practically reversed, Baltimore prices stood 25 per cent below those prevailing in New York. The deduction to be drawn from this wide varying price movement is that distribution in respect to the demand requirements is unequal between the markets. It would appear that the growers or shippers upon observing that a minor glut was existing in New York reconsigned their tomatoes to Baltimore or some other market, or, in any case, held them out and did not forward them to that market which resulted in a scarcity there. However, until the relationship between supply and price has been measured and it has been ascertained if supply is the chief factor influencing the price level, we cannot come to that conclusion, of course. Once demonstrated that the volume in the market is a chief price determinant, as has been shown in the case of watermelons, such a conclusion becomes at once substantiated. Suffice to say that we are able to demonstrate that the flow is intermittent and uneven, proving clearly that distribution as it is being conducted to-day is in a large way at fault. Through a knowledge of the potential demand of several of the chief markets and with a knowledge of the amount to be distributed, together with a general understanding of the purported marketing conditions at the several cities, certainly much is to be accomplished through the regulation of shipments and the proper allocation of cars after the same have started rolling.

The other feature to be taken into account in attempting better marketing practices is that of grading. It is beyond our power to regulate weather conditions—rainfall and temperature—and even though planting may be for the exact acreage shown to meet adequately the various requirements under normal production, we are not certain that a 90 per cent normal crop or a 120 per cent normal crop will be produced because of the uncertain weather conditions. But assuming, however, that God has blessed the season with rain, proper temperature and a large crop results, what is the best distribution to make of it? Simply be-

cause it is grown is not sufficient reason why an attempt should be made to market it all when that attempt means out-of-pocket loss to the farmer and freight deficits to the carrier. We might as well come out flat-footed and make an explicit declaration and say that it is far better from the farmer's viewpoint, also from the viewpoint of society, to leave the produce on the farms to be fed to the hogs or rot on the fields rather than take from the purse of society funds to pay the cost of selling in the city markets. Society eventually will be required to make up the deficit. There are many who do not thoroughly appreciate the farmer's position in this respect and contend that there is much danger of going too far. Until losses in wastage through dumping, and losses to the carrier and shipper due to a demoralized market, are greatly reduced or eliminated, these opposing views are premature. Every man is entitled to the product of his labor and if he is required to pay out-of-pocket money to market his product then surely he is within his rights if he decides to make disposition of a portion of his crop at the farm. Explicitly then may we not say that during times of large crops much is to be gained through eliminating, by proper grading, the poorer quality produce. When the markets are over-saturated and prices are at freight level or below, it is inadvisable to ship these smaller sizes and lower grades of fruits and vegetables.

These are the only two avenues of escape so far as we see. Of course we know of the splendid work which has been in progress and of the accomplishments so far realized in adjusting production through the regulation of acreage, also in growing the commodities that fit well into the market requirements, and much will be done in that direction in the future, but as long as there remains over-production (and it will remain irrespective of what the acreage is) the alternative method is for proper grading. By including only that which is demanded most, which is the better quality, the shipper's chances of obtaining costs are greatly increased; first, for the reason that he is offering a finer quality product; and second, for the reason that dumping will be less characteristic.

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